Title: Alaris Infusion Pump	Disclaimer: This procedure provided "as is" and with possible faults. User must verify before use. Neither provider nor website assumes any responsibility for its use.
Date: 7-29-2010 Rev 11-11-11 Update Disclaimer	
File = alaris3.doc	

1. General
   Applies to the Alaris Models 7100 thru 7200.
   Example: Model 7130

2. Reference Documents:
   Technical Service Manual (Signature Edition)
   Training Manual if available

3. Tools / Fixtures / Labels
   Safety Tester
   Ivac Signature Administration Set (AccuSlide)
   Scale accurate to 0.1 gram (preferred method) and cup for collecting output of pump. See picture.
   Green Write-on Label ex: Veriad P/N 171332
   Clear Shield Label ex: Veriad P/N US408

4. Initial Inspection
   4.1. Check labels, cleanliness, line cord, cracks in cabinet.
   4.2. Exercise the latch mechanism, checking for normal movement.
   4.3. Check appearance of peristaltic cam actuators.
   4.4. Mounting bracket and its knob/screw.
   4.5. Check tightness of cable strap screw.
   4.6. Air-in-Line detecting surface must be clean. There is a small note on the front case pointing to this spot.

5. Setup and Diagnostics
   5.1. While holding down the upper left-hand soft key, press the power-on button; this opens the unit in the diagnostic mode.
   Note: Hit <page> to "scroll" forward.

   5.2. Check Date/time and update if necessary
   5.3. Reset the PM interval.
   Note: Electrical Safety: Use the strap metal button as a contact for the following. Loosen and then re-tighten this screw to insure good chassis contact. Holding your gnd lead tight to button helps.
   5.4. Using the safety tester, check that leakage with ground open is less than 100 uA ("Case In" on some testers).
   5.5. Using the safety tester, check that ground lead resistance is less than 0.100 ohms.

5.6. Fan Check: Turn unit on unplugged; then plug in line cord. Normal faint fan noise should now be heard. Recommended: Blow dust from fan housing after first removing battery for access.
5.7. Battery Check: The Measured capacity > should be greater than the assigned capacity. After a ½ hr charge, the bat bar graph should be at least 50%. If not, see appendix for the Battery Refresh procedure.

6. Flow, Rate, Occlusion, Air-in-line, and Pressure Check
6.1. Turn unit on; <Accept>ing the current configuration (ICU for example); Clear patient data <Yes>, and then hitting <Primary Infusion> . Get administration set (see picture) ready by insuring that it flows freely with no air bubbles apparent.

Note: The following for flow/volume is only a QuickCheck. See Appendix when updating the volume cal factor is required.
6.2. Set Flow rate to 600ml/hr and Volume = 20mL.
6.3. Hit Run/Hold. With no cassette, get message "Set Out" etc.
6.4. Inset full cassette; press "Run/Hold". In exactly 2 minutes, the pump should deliver 20mL +/- 5% If outside this range, see appendix.
Note: If display says "Instrument Self Check is Due", follow on screen prompts and be sure to wait up to one minute for this internal task to finish.
6.5. Reprogram the unit for 7-9 mL volume; press <Run>.
6.6. Upstream Occlusion: As soon as the flow begins, pinch the upstream hose line. Pump will halt and display "Occlusion upstream" or equivalent.
6.7. Silence Alarm: Now is good time to check this.
6.8. Downstream Occlusion: Restart the flow. Pinch the output hose. The unit often displays "Checking Line" multiple times before finally halting with an Occlusion message.
6.9. Air-in-Line: Run unit with empty cassette. Must get alarm. Clean the shiny xducer surface with damp Q-tip before proceeding.
6.10. Pressure Calibration (or check). If/when required, see appendix.

7. Wrapup (depends on institution)

7.1. Re-label: Replace old PM label with dated and initialized green. Protect by applying clear cover label.
7.2. Cross unit off the check list.

APPENDIX

Battery Refresh Cycle
1. Disconnect the battery; press the ON/OFF switch for 5 seconds; and reconnect the battery.
2. Plug unit in. Turn-on in the diagnostic mode. If software is 2.02 or higher, enter 0.0 aH in the rated capacity for battery; hit OK. Re-enter 1.3 into the battery capacity field. Once <ok> is pressed, cycle will start. Note that the battery bar graph will jump to 15-16 bars.

3. Leave connected to AC for 24 hours to complete cycle. The discharge, as shown by a diminishing bar graph, will take several hours for just this phase.

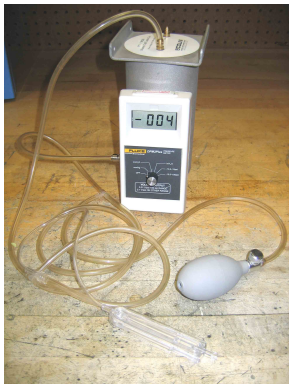
Flow Calibration

Note: Accuracies on the order of 1% are obtainable with this method. Protocols in the pump software will not allow a straightforward change in the volume cal factor. Therefore for example, if an initial volume check shows a result outside the 5% error range, the technician is required to change the cal error to 0 (the only change allowed at this point) and run a second volume check. After entering the results of this second check, a third and final check is then required.

1. Flow Calibration is done with a normal but factory pre-measured cassette, P/N 80VCS. Note that it comes with a cal value (such as 39.1 on its accompanying sheet) which relates to the volume delivered at 40 ml from a perfect pump.
2. Program the pump to run at 400 ml/hr with a volume limit of 40ml. If the collected result is within 1% of the expected (39.1 in this case), the pump is in-cal. Compute [(Vcollected/Vexpected)-1], where Vexpected is the cal number assigned to this "special" cassette. A typical collection result, 38.5, as a percent would be -1.5%
3. If out of cal, one or more additional collections are now required. Turn the pump on in the diagnostic mode and "page" over to page D4. Hit the soft key for Cal Rate. The re-cal process forces the user to limit the next cal entry to only 0%. Do this by first hitting the upper left softkey twice, and then enter 0.
4. Re-start unit, and then run another 40ml @ 400ml/hr check. Recalculate [(Vcollected/Vexpected)-1]. If the result is within 1%, no more is required. Otherwise…
5. Return to diagnostics. In the rate cal location, enter the opposite of what "cal = 0 mode" yielded in step 4 above.
6. Run a third and normally final volume check. [(Vcollected/Vexpected)-1] should calculate to less than or equal to 0.01 (1%).

Pressure Calibration

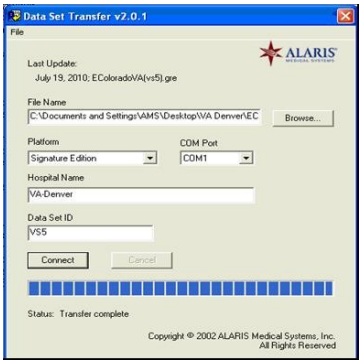
Note: To check pressure without entering any data, note the last line on the "Cal Pressure" screen aka "Sensor". With 0 mmHg in, it should not exceed +/-2; at 500mmHg in, it should read 500 +/- 3.



1. Enter the diagnostic mode by holding down upper left soft key and the hitting the power button. Scroll/page to page D6 and hit <Cal Pressure> button.
2. Install the pressure cassette (P/N 70ISS). Note that the constants/offsets displayed may change a small amount.
3. Be sure the pressurizing bulb is open so that there is no line pressure. Press the "0 mmHg" key; the resultant displayed constant will usually slightly update and indicate "pass", however a "failure" message is not uncommon and does not indicate a pump problem – only that the following steps must be taken.
4. Pump system up to 500mmHg and after a stable reading hit the "500 mmHg key". Unit will respond by updating the corresponding constant, indicate "pass", and show "sensor = 499" or a number very close.
5. Release circuit pressure and the sensor line should indicate 0000 +/- 1. Press <OK>.
6. Don't forget to press <OK> above.

Lifeguard Update

Note: The internal drug library is updatable, and requires a Windows based PC/Laptop with an RS232 output cable.



1. Call up program "Data Set Transfer" (V2.0.1); connect the RS232 to the Alaris unit. Complete the field "hospital name" and the data set ID info; "VS5" is a recent example.
2. With the pump off, hit "Connect", then turn pump on. Within approximately 5 seconds, the bar graph in the transfer program will begin to progress. (The displays on the pump will remain blank.)
3. After "Transfer Complete" message, turn the pump on – this will finalize the transfer. Be sure to re-attach connector cover.
4. The pump may be verified by using the diagnostic mode and paging through history.

I.D. :	Date:
CASE INTEGRITY	
FAN NOISE	
LATCH MECHANISM	
CLEAN THE AIR-IN-LINE	
CHECK AIR-IN-LINE	
DATE / TIME	
RESET PM INTERVAL	
GROUND RESISTANCE	
CASE LEAKAGE	
VOLUME ACCURACY	
OCCLUSION (Upstream)	
OCCLUSION (downstream)	
PRESSURE CHECK	
Battery Refresh Cycle	
Update Guardrail?	
Comments:	

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